We claim:

1. A method of reducing GAG content in a glial scar comprising inhibiting one or more of the following:
--inhibiting the expression of primary proteoglycans;
--inhibiting the expression and/or activity of a chain initiation enzyme; and
--inhibiting the expression and/or activity of a chain elongation enzyme.

2. The method of claim 1, wherein the primary proteoglycans are selected from the group consisting of neurocan, NG2, and phosphocan.

3. The method of claim 1, wherein the chain initiation enzyme is a xylotransferase.

4. The method of claim 1, wherein the chain elongation enzyme is selected from the group consisting of N-acetylgalactosaminyl transferase, glucuronosyltransferase, glucosaminyltransferase, galactosaminyltransferase, N-sulfotransferase, 6-sulfotransferase, 3-sulfotransferase, 1,4-glucosaminyltransferase, 1,4-galactosaminyltransferase, N-acetylglucosamine, and glucuronic acid.

5. The method of any one of claims 1 or 2, wherein expression of the primary proteoglycan is inhibited by administering an agent.

6. The method of claim 5, wherein said agent is selected from the group consisting of antisense oligonucleotides that bind a nucleic acid sequence encoding a proteoglycan; ribozymes, DNA enzymes, RNAi constructs, and small molecules.

7. The method of claim 6, wherein the antisense oligonucleotide binds a nucleic acid as set forth in any one of SEQ ID No: 17, SEQ ID No: 19, SEQ ID No: 21, SEQ ID No: 23, SEQ ID No: 25, SEQ ID No: 27, SEQ ID No: 29, and SEQ ID No: 31.

8. The method of any one of claims 1 or 3, wherein expression and/or activity of the chain initiation enzyme is inhibited by administering an agent.

9. The method of claim 8, wherein the agent is selected from the group consisting of antagonists, antibodies, antisense oligonucleotides that bind a nucleic acid sequence encoding a chain initiation enzyme; ribozymes, DNA enzymes, RNAi constructs, and small molecules.

10. The method of claim 9, wherein the antisense oligonucleotide binds a nucleic acid as set forth in any one of SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, and SEQ ID NO: 11.

11. The method of claim 8, wherein the antisense oligonucleotides are selected from the group consisting of SEQ ID NO: 37 and SEQ ID NO: 38.

12. The method of claim 8, wherein the agent is a DNA enzyme.

13. The method of claim 12, wherein the DNA enzyme is set forth in SEQ ID NO: 33 or SEQ ID NO: 39.

14. The method of any one of claims 1 or 4, wherein expression and/or activity of the chain elongation enzyme is inhibited by administering an agent.

15. The method of claim 14, wherein the agent is selected from the group consisting of antagonists, antibodies, antisense oligonucleotides that bind a nucleic acid sequence encoding a chain initiation enzyme; ribozymes, DNA enzymes, RNAi constructs, and small molecules.

16. The method of claim 15, wherein the antisense oligonucleotide binds a nucleic acid as set forth in any one of SEQ ID No: 13 or SEQ ID No: 15.

17. A method of promoting neuronal regeneration comprising inhibiting a chain initiation enzyme.

18. The method of claim 17, wherein the chain initiation enzyme is a xylotransferase.

19. The method of claim 18, wherein the enzyme is inhibited by administering an agent.

20. The method of claim 19, wherein the agent is selected from the group consisting of antagonists, antibodies, antisense oligonucleotides that bind a nucleic acid sequence encoding a chain initiation enzyme, ribozymes, DNA enzymes, RNAi constructs, and small molecules.

21. The method of claim 20, wherein the antisense oligonucleotide binds a nucleic acid as set forth in any one of SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, and SEQ ID NO: 11.

22. The method of claim 20, wherein the antisense oligonucleotides are selected from the group consisting of SEQ ID NO: 37 and SEQ ID NO: 38.

23. The method of claim 20, wherein the agent is a DNA enzyme.

24. The method of claim 23, wherein the DNA enzyme is set forth in SEQ ID NO: 33 or SEQ ID NO: 39.

25. The method of claim 17, further comprising administering a growth factor or a neurotrophic factor.

26. The method of claim 25, wherein the neurotropic factor is selected from the group consisting of nerve growth factor, brain-derived growth factor, neurotrophin 3, neurotrophin 4, neurotrophin 5, glial derived neurotrophic factor, and ciliary neurotrophic factor.

27. The method of claim 25, wherein the growth factor is basic fibroblast growth factor.

28. The method of claim 26 or 27, further comprising administering a proteoglycan specific enzyme.

29. A method of screening to identify and/or characterize an agent, wherein said agent is capable of one or more of the following:

(i) inhibiting the expression of a primary proteoglycan;
(ii) inhibiting the expression and/or activity of a chain initiation enzyme;
(iii) inhibiting the expression and/or activity of a chain elongation enzyme; or
(iv) inhibiting the expression and/or activity of a chain sulfation enzyme.

30. The method of claim 29, wherein said agent promotes neuronal regeneration and/or promotes the inter-mixing of Schwann cells and astrocytes.

31. A method of screening to identify and/or characterize an agent, wherein said agent is capable of one or more of the following:

(i) reducing scar formation;
(ii) promoting inter-mixing of Schwann cells and astrocytes; or
(iii) promoting neuronal regeneration.

32. The method of any of claims 29-31, wherein said agent is selected from the group consisting of antagonists, antibodies, antisense oligonucleotides, ribozymes, DNA enzymes, RNAi constructs, and small organic molecules.

33. The method of claim 32, wherein said method comprises screening a library of agents.

34. The method of claim 29 or 31, further comprising formulating a pharmaceutical preparation of an agent identified and/or characterized by said method and a pharmaceutically acceptable carrier or excipient.

35. A pharmaceutical preparation comprising an agent identified by the method of claim 29 or 31 and a pharmaceutically acceptable carrier or excipient.

36. The method of claim 34, further comprising packaging, marketing, and selling said pharmaceutical preparation.

37. A kit comprising the pharmaceutical preparation of claim 35 and instructions for the use of said pharmaceutical preparation in human or non-human patients.

38. Use of an agent in the manufacture of a medicament for decreasing expression and/or activity of a xylotransferase, wherein said agent is a DNA enzyme that binds to and inhibits expression and/or activity of a xylotransferase.

39. Use of an agent in the manufacture of a medicament for decreasing expression and/or activity of a xylotransferase, wherein said agent is an antisense oligonucleotide that binds to and inhibits expression and/or activity of a xylotransferase.

40. A composition comprising an agent, wherein said agent inhibits the expression and/or activity of a xylotransferase, and wherein said agent is a DNA enzyme that binds to and inhibts the expression and/or activity of a xylotransferase.

41. A composition comprising an agent, wherein said agent inhibits the expression and/or activity of a xylotransferase, and wherein said agent is an antisense oligonucleotide that binds to and inhibts the expression and/or activity of a xylotransferase.

42. A composition comprising an agent, wherein said agent inhibits the expression and/or activity of a xylotransferase, and wherein said agent is an RNAi construct that binds to and inhibts the expression and/or activity of a xylotransferase.

43. The composition of any of claims 40-42, wherein the xylotransferase is XT-I.

44. The composition of any of claims 40-42, wherein the xylotransferase is XT-II.

45. The composition of any of claims 40-42, wherein the xylotransferase is XT-I and XT-II.

46. A DNA enzyme as set forth in SEQ ID No: 33 or SEQ ID NO: 39.

47. An antisense oligonucleotide as set forth in any one of SEQ ID No: 37 or SEQ ID No: 38.

48. A composition comprising a DNA enzyme, wherein said DNA enzyme binds to and inhibits the expression and/or activitiy of a xylotransferase, wherein said DNA enzyme is represented by the general formula

$$B_1\text{-}X\text{-}B_2$$

wherein X corresponds to a DNA enzyme nucleotide sequence, B_1 corresponds to a nucleotide sequence complementary to a nucleotide sequence of a xylotransferase, and B_2 corresponds to a nucleotide sequence complementary to a nucleotide sequence of a xylotransferase, and wherein B_1 and B_2 are complementary to nucleotide sequences of a xylotransferase that are adjacent but separated by at least one nucleotide.

49. The composition of claim 48, wherein the xylotransferase is XT-I

50. The composition of 48, wherein the xylotransferase is XT-II.

51. The composition of claim 48, wherein the xylotransferase is XT-I and XT-II.

52. The composition of claim 48, wherein said composition is a pharmaceutical composition formulated in a pharmaceutically acceptable carrier.

53. Use of an agent in the manufacture of a medicament for decreasing GAG content, wherein said agent is a DNA enzyme that binds to and inhibits expression and/or activity of a xylotransferase.

54. Use of an agent in the manufacture of a medicament for decreasing GAG content, wherein said agent is an antisense oligonucleotide that binds to and inhibits expression and/or activity of a xylotransferase.